Abstract:
The occurrence of dengue fever in one place heavily influenced by incident in other places, it is associated with the ability of the mosquito fly of *Aedes Aegypti*. However, passively, mosquitoes can move further because of the wind, the vehicle or the mobilization of the population. The aim of this research is to find patterns and models of dengue fever occurrence in terms of behavior and environmental aspects with regard territorial effect. This study uses the approach area and use queen contiguity weighting matrix. As the unit of analysis in this study is the subdistricts. The results showed that the pattern of spread of dengue fever cases in Tanete Raiattang District and West Tanete Riattang are clustered (Clustered).

Model of dengue fever incidence based on behavioral aspects are:

\[ Y_i = 41.03 + 0.38 \sum_{j=1, j \neq i}^{n} w_{ij} y_j - 0.55 x_1 + 0.27 x_3 - 0.43 x_4 - 0.62 x_5 + 0.39 x_6 - 0.19 x_7 - 0.15 x_8 + 0.33 x_9 \]

With \( R^2 = 90.3 \% \). This means that taking into account the spatial effects obtained that behavioral factors can explain the variable incidence of dengue fever diversity of 90.3%. Model of dengue fever incidence based on the environmental aspects are:

\[ Y_i = 54.25 + 0.30 \sum_{j=1, j \neq i}^{n} w_{ij} y_j - 0.56 x_{12} \]

With \( R^2 = 85.9 \% \). This means that taking into account the spatial effects obtained environmental factors can explain the diversity of the variable incidence of dengue fever was 85.9%. Spatial structural equation model of dengue fever occurrence and behavior based on environmental aspects are:

\[ \eta_i = 0.02 + 0.19 \sum_{j=1, j \neq i}^{n} w_{ij} \eta_j - 0.46 \text{ environment} - 0.52 \text{ behavior} \]

With \( R^2 = 72.9 \% \). This means that taking into account the spatial effects obtained that behavioral and environmental factors can explain the diversity of the variable incidence of dengue fever was 72.9%. The health centers are advised discriminate larvae checks periodically and simultaneously in all villages in the Tanete Riattang District and West Tanete Riattang. Government needs to make regulations about the handling of *Aedes aegypti* mosquito larvae that houses found no larvae fines, in the District of Tanete Riattang and West Tanete Riattang.

Key words: Model, SEM, Spatial, Dengue Fever
Introduction

Dengue Hemorrhagic Fever (DHF) is a public health problem in Indonesia and often lead to an eruption of Extraordinary Events with a large loss. Tanete Riattang District and West Tanete Riattang, Bone Regency is a district that has the highest incidence rate of dengue cases for the 137/1000 and 157 / 100,000 population in 2013 (Program P2DBD Bone regency, health office). The incidence of dengue fever in an area of very influential to the surrounding area due to Traffic mosquito Aedes aegypti Terban. But passively, mosquitoes can move further because of the wind, the vehicle or the mobilization of the population. This event is in line with the first law of geography advanced by W Tobler in Anselin (1989) [1], which reads: "Everything is related to everything else, but near thing are more related than distant things." Everything is related to each other, but something close more than anything that has influence far. That law is the pillar of the regional science studies. Existence of spatial effects is a common thing between one region to another region. At spatial data, it is often observed at a given location depends on the observations at the location another adjacent (neighboring).

Modeling the incidence of dengue fever has been developed by many researchers, among others, by Nagao et al. (2007) [2], Naing et al. (2011) [3], Herrera-Martinez (2010) [4] review of the factors influencing the incidence of dengue fever by using linear regression analysis. Anselin (2003) [1] explains when a linear regression model is used as a tool in the analysis of spatial data, it can lead to inaccurate conclusions due to the assumption of independent errors and the assumption of homogeneity is not met. Therefore, statistical methods are needed that can cope with the phenomenon of the spatial variability of the data. The nature of spatial data is to have cross-correlated nature of the error (spatial autocorrelation or spatial dependence) and the presence of spatial heterogeneity. The model will be used in this study is a model which spatial regression and spatial models structure equation. This model will be the approach of using the area weighting queen contiguity matrix. Approach the area in addition to the distance, can also be taken into account other risk factors, in this case is the presence of endemic areas and the mobilization of the population that influence the spatial variation in dengue cases.

Materials and Methods

Research Type

This study is the analysis of the model with account for the incidence of dengue fever in the district of a territorial aspect Tanete Riattang and West Tanete Riattang Districts, Bone. Unit Analysis was the urban / rural in the District of Tanete Riattang and West Tanete Riattang. Then all urban villages in 20 districts were selected sample of households taken as a simple random sampling. The sample size of 320 households.

Procedure and Data Collection

Primary data collection regarding behavior done with interviews and observations, interviews conducted for environmental data, observation and checks list while the data obtained using questionnaires and DHF as a comparison of data taken at the clinic or hospital.

Method and Data Analysis

Analysis of the data using spatial regression and Spatial Structural Equation Modeling (SEM Spatial) with ArcView GIS version 3.3 program, GeoDa, and software SPSS SmartPLS.

Results

The pattern of dengue cases spread

The pattern of spread of dengue fever cases in the District Tanete Riattang and West Tanete Riattang can be seen in the map below:
Figure 1: The incidence rate of dengue fever every village

Figure 1 explains the dengue incidence rate in each village in the District of Tanete Riattang and West Tanete Riattang. Diversity of color indicates the magnitude of the incidence rate of dengue fever which consists of three categories: the incidence rate of dengue fever (0-100), (100.1 - 200) and (200.1 - 485.8). Group of villages belonging DHF incidence rate between 0-100 are sub district of Polewali, Mattito Walie, Watang Palakka, Bulu Tempe and Majang. Group of villages that dengue incidence rate between 100.1 - 200 are: Macege, Ta’, Watampone and Biru. While the group of villages that dengue incidence rate between 200.1 - 485.8 are: Pallopo, Macanang, Bukaka, Jeppe, Manurunge, Masumpu and Walannae.

Results of Analysis of Dengue Fever Model based on the Behavior Aspects Noting on Spatial Effects.

The results of the analysis of the model based on the behavioral aspects of dengue fever by using the weighted matrix queen contiguity obtained the following results:

Table 1: Results of analysis models based on the behavioral aspects of dengue fever with weighting matrix Queen Contiguity

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Z Value</th>
<th>P</th>
<th>R² value</th>
</tr>
</thead>
<tbody>
<tr>
<td>W_DBD</td>
<td>0.31</td>
<td>2.32</td>
<td>0.027</td>
<td></td>
</tr>
<tr>
<td>Konstanta</td>
<td>39.46</td>
<td>5.93</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Cleaning (X1)</td>
<td>-0.51</td>
<td>-4.56</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Covering (X2)</td>
<td>0.06</td>
<td>1.34</td>
<td>0.179</td>
<td></td>
</tr>
<tr>
<td>Draining (X3)</td>
<td>0.22</td>
<td>2.39</td>
<td>0.016</td>
<td>0.903</td>
</tr>
</tbody>
</table>
Table 1 explains that the results of the analysis of dengue fever occurrence models based on behavioral aspects taking into account the effect of the spatial weighting matrix queen contiguity in Tanete Riattang District and West Tanete Riattang with GeOda program obtained that p values for variables habit of cleaning water reservoirs = 0.000 is smaller than α = 0.05, then Ho is rejected, it means no cleaning water reservoirs influence on the incidence of dengue fever. Variable of habit of closing the water reservoirs obtained value of p = 0.179 is greater than α = 0.05, then Ho is accepted means that there is no influence of a reservoir close to the incidence of dengue fever. Variable habits drain water reservoirs obtained value of p = 0.016 is smaller than α = 0.05, then Ho is rejected it means there is a reservoir of water draining effect on the incidence of dengue fever.

Variables custom to bury second-hand goods acquired value of p = 0.000 is smaller than α = 0.05, then Ho is rejected it means no custom to bury the influence of second-hand goods on the incidence of dengue fever. Variable habit of disposing waste in place or burn obtained value of p = 0.000 is smaller than α = 0.05, then Ho is rejected it means there is influence of a habit of throwing waste in place or burn on the incidence of dengue fever. Variable hanging clothes obtained p value = 0.029 is smaller than α = 0.05, then Ho is rejected it means no influence in the habit of hanging clothes closet on the incidence of dengue fever.

Variable of using nets when sleeping obtained value of p = 0.000 is smaller than α = 0.05, then Ho is accepted it means no influence on the habit of using mosquito nets while sleeping on the incidence of dengue fever. Variable habit of wearing repellents obtained value of p = 0.002 is smaller than α = 0.05, then Ho is rejected it means no influence wear mosquito repellent when sleeping on the incidence of dengue fever. Sow a habit variable abate powder to the water reservoirs obtained value of p = 0.000 is smaller than α = 0.05, then Ho is rejected it means no influence sow a habit abate powder in water reservoirs on the incidence of dengue fever.

The next stage is the issue of modeling variables that are not significant in the way the habit of closing this variable water reservoirs. Results obtained are as follows:

Table 2: Results of the analysis based on the behavioral aspects of dengue models with weighting matrix Queen Contiguity

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>Z value</th>
<th>P</th>
<th>R² value</th>
</tr>
</thead>
<tbody>
<tr>
<td>W_DBD</td>
<td>0.38</td>
<td>2.01</td>
<td>0.044</td>
<td></td>
</tr>
<tr>
<td>Konstanta</td>
<td>41.03</td>
<td>5.89</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Cleaning (X1)</td>
<td>-0.55</td>
<td>-4.81</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Draining (X3)</td>
<td>0.27</td>
<td>2.32</td>
<td>0.016</td>
<td>0.894</td>
</tr>
<tr>
<td>Burying (X4)</td>
<td>-0.43</td>
<td>-4.5</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Disposing (X5)</td>
<td>-0.62</td>
<td>-4.47</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Hanging (X6)</td>
<td>0.39</td>
<td>3.05</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td>Using Net (X7)</td>
<td>-0.19</td>
<td>-2.69</td>
<td>0.007</td>
<td></td>
</tr>
<tr>
<td>Anti mosquito (X8)</td>
<td>-0.15</td>
<td>-2.73</td>
<td>0.006</td>
<td></td>
</tr>
<tr>
<td>Abate powder (X9)</td>
<td>0.33</td>
<td>4.10</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>
On table 2, a new model was obtained as follow:

\[ Y_i = 41.03 + 0.38 \sum_{j=1,i \neq j}^{n} w_{ij} y_i - 0.55X1 + 0.27X3 - 0.43X4 - 0.62X5 + 0.39X6 - 0.19X7 - 0.15X8 + 0.33X9. \]

**Results analysis of dengue fever model based on environmental aspects by taking into account the spatial effects.**

The results of the analysis of dengue models based on environmental aspects to take into account spatial effects with GeoDa software are as follows:

**Table 3: Results of the analysis of dengue based models by taking into account the environmental aspects of spatial effects**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>z value</th>
<th>P</th>
<th>R^2 Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>W-DBD</td>
<td>0.35</td>
<td>0.92</td>
<td>0.043</td>
<td>0.859</td>
</tr>
<tr>
<td>Konstanta</td>
<td>43.45</td>
<td>4.29</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Ventilation (X10)</td>
<td>0.05</td>
<td>0.78</td>
<td>0.433</td>
<td></td>
</tr>
<tr>
<td>Closed water container (X11)</td>
<td>0.07</td>
<td>1.10</td>
<td>0.268</td>
<td>0.859</td>
</tr>
<tr>
<td>Larvae existence (X12)</td>
<td>-0.56</td>
<td>-7.41</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Density occupant (X13)</td>
<td>0.07</td>
<td>0.80</td>
<td>0.422</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 describes the home environment that consists of variable ventilation obtained p value = 0.433 is greater than \( \alpha = 0.05 \), then Ho is accepted meaning no ventilation effect on the incidence of dengue fever home. Variable belongs to a closed water container obtained value of p = 0.268 is greater than \( \alpha = 0.05 \), then Ho is accepted it means there is no effect of belonging to a closed water reservoirs on the incidence of dengue fever. Variable presence of larvae in the water reservoirs obtained value of p = 0.000 is smaller than \( \alpha = 0.05 \), then Ho is rejected it means no influence on the existence of larva water reservoirs on the incidence of dengue fever.

Variable density residents obtained p value = 0.422 is greater than \( \alpha = 0.05 \), then Ho is accepted it means there is no effect on the incidence density of residents dengue fever.

The model is as follows:

\[ Y = 43.45 + 0.35 \sum_{j=1,i \neq j}^{n} w_{ij} y_i + 0.05X10 + 0.07X11 - 0.56X12 + 0.07X13 \]

The next stage is the issue of modeling variables that are not significant in the way this variable ventilation, water and shelter belongs occupant density. Results obtained are as follows:

**Table 4: Results of the analysis of dengue based models by taking into account the environmental aspects of spatial effects**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Z Value</th>
<th>P</th>
<th>R^2 Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>W-DBD</td>
<td>0.30</td>
<td>0.90</td>
<td>0.045</td>
<td></td>
</tr>
<tr>
<td>Konstanta</td>
<td>54.25</td>
<td>10.98</td>
<td>0.000</td>
<td>0.859</td>
</tr>
<tr>
<td>Keberadaan Jentik (X12)</td>
<td>-0.56</td>
<td>-9.46</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

On table 4, a new model was obtained as follow:

\[ Y_i = 54.25 + 0.30 \sum_{j=1,i \neq j}^{n} w_{ij} y_i - 0.56X3 \]

where:

\[ Y = \text{The incidence of DHF headman to-i} \quad W_{ij} = \text{The spatial weighting matrix.} \]

**Structural equation model based on the spatial incidence of dengue fever and environmental aspects of behavior**

Results of structural equation modeling analysis of dengue incidence based spatial aspects of behavioral and environmental factors by PLS software, ArcView and GeoDa is as follows:
Table 5: Results of structural equation modeling analysis based on the spatial aspects of behavior and environment

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Z Value</th>
<th>P</th>
<th>R² Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>W-DBD</td>
<td>0.19</td>
<td>0.92</td>
<td>0.353</td>
<td></td>
</tr>
<tr>
<td>Konstanta</td>
<td>0.02</td>
<td>0.17</td>
<td>0.864</td>
<td></td>
</tr>
<tr>
<td>Environment</td>
<td>-0.46</td>
<td>-2.54</td>
<td>0.011</td>
<td>0.729</td>
</tr>
<tr>
<td>Behavior</td>
<td>-0.52</td>
<td>-2.89</td>
<td>0.003</td>
<td></td>
</tr>
</tbody>
</table>

On Table 5, a new model was obtained as follow:
\[ \eta_i = 0.02 + 0.19 \sum_{j=1,i \neq j}^n w_{ij} \eta_i - 0.46 \]
Environment - 0.52 behavior

Discussion

a. The pattern of spread of dengue fever cases in terms of the spatial aspects

Spatial pattern or spatial pattern is something that shows the placement or arrangement of objects on the earth's surface. Spatial pattern will explain how geographically distributed phenomena and how it compares to other phenomena. Spatial statistics is a tool that is widely used to describe and analyze the spatial pattern, i.e., how the geographical objects and changes occur at a given location. It also can compare the pattern of these objects with the objects pattern found in other locations.

Spatial pattern type consists of random, uniform, and clustered or can be seen as shown below:

From the results of the study showed that the pattern of the spread of dengue fever in the district Tanete Riattang and West Tanete Riattang can be seen in the following:
Subdistrict Tanete Riattang and Tanete Riattang West are clustered (Clustered). This suggests that the spread of dengue fever cases in the area will greatly influenced the area or spatial factors. If the area is an endemic dengue, it greatly affects the incidence of dengue fever nearby areas. These results are consistent with the theory proposed by Tobler in Anselin (1989) [1], which reads: "Everything is related to everything else, but near thing are more related than distant things." Everything is related to each other, but something close has greater influence than anything much.

b. Models of incidence of hemorrhagic fever base on behavioral aspects by taking into account the spatial aspects.

The results of the analysis of dengue fever occurrence models based on behavioral aspects taking into account the effect of the spatial weighting matrix Queen Contiguity in District of Tanete Riattang and West Tanete Riattang with GeOda program found that the behavior aspects of the nine variables, only one variable is a variable that is not significant habit of closing the water container. So there are six variables did not significantly change from becoming significant. This is due to the influence of spatial effects. Because the R2 value after taking into account the spatial effects is greater than the spatial effect regardless, the most valid conclusion is modeled after accounting for spatial effects.

The model is obtained taking into account spatial effects are:

\[ Y_i = 39.46 + 0.31 \sum_{j=1,i\neq j}^n W_{ij} Y_j -0.51X1 + 0.27 \\
X2 + 0.22 X3 - 0.39 X4 - 0.58 X5 + 0.30 X6 - 0.16 X7 - 0.21 X8 + 0.38 X9. \]

With \( R^2 = 90.3 \). This means taking into account the spatial effects of an increase in the value of R2 of 88%, 90.3% womanly. It means that taking into account the spatial effects obtained that behavioral factors can explain the variable incidence of dengue fever diversity of 90.3%, while the rest is explained by variables beyond that. In this model there is no one variable that is not significant, which closes habits water reservoirs. The next stage of modeling insignificant variables excluded from the model in order to get the new model as follows:

\[ Y_i = 41.03 + 0.38 \sum_{j=1,i\neq j}^n W_{ij} Y_j -0.55X1 + 0.27 \\
X3 - 0.43 X4 - 0.62 X5 + 0.39 X6 - 0.19 X7 - 0.15 X8 + 0.33 X9. \]

Interpretation of the model are:

Intercept of 41.3 means that if the variable behavior if all = 0, it predicted that the incidence number of dengue fever cases by 41 people. Spatial lag coefficient = 0.38 means that if an incident occurs dengue area up one unit, it can increase the incidence of dengue fever in the near by region of 38 people per 100. This figure also show the presence of dengue fever occurrence depend on from one region to the other regions. If other factors held constant, if the habit of cleaning up the water reservoir, the unit
can reduce the incidence of dengue fever was 55 people per 100 people. If other factors held constant, if the habit of draining the water reservoir up one unit can then raise the incidence of dengue fever was 27 people per 100 people. Positive effect is due to the habit of brushing public shelters in case. Brushing shelter will waste water so that water payments will rise. If other factors held constant, if the habit of burying the used goods rose one unit it can reduce the incidence of dengue fever was 43 people per 100 people. If other factors held constant, if the habit of throwing garbage on place and burn up one unit it can reduce the incidence of dengue fever was 62 people per 100 people.

If other factors regarded constant, if the habit of hanging out clothes closet up one unit can then raise the incidence of dengue fever by 39 people. If other factors held constant, if the habit of using mosquito nets while sleeping up one unit it can reduce the incidence of dengue fever was 19 people per 100 people. If other factors held constant, if the habit of wearing repellents up one unit it can reduce the incidence of dengue fever at 15 people per 100 people. If other factors held constant, if the habit of sowing abate on the water reservoir up one unit can then raise the incidence of dengue fever by 33 people per 100 people. Positive effect is due to the habit of sowing abate the water reservoirs or health worker came to give abate in case. This indicates that the handling of cases of dengue fever in the District of Tanete Riattang and West Tanate Riattang not preventive. With this model we can predict the magnitude of dengue incidence in terms of behavior of every village in the Tanete Riattang district and West Tanate Riattang.

c. Models based on the incidence of hemorrhagic fever with environmental aspects into account spatial aspects.

The results of the analysis of dengue fever occurrence models based on environmental aspects to take into account the spatial effects using weighted matrices Queen Contiguity in District of Tanete Riattang and West Tanate Riattang with GeOda program found that the environmental aspects of the four variables only one significant variable is the variable presence of larvae in the water reservoirs. R2 value after taking into account the spatial effect is greater than the spatial effect regardless, the most valid conclusion is modeled after accounting for spatial effects. This is due to the influence of spatial effects.

The model is obtained taking into account spatial effects are:

\[ Y_i = 43.45 - 0.15 \sum_{j=1}^{n} w_{ij} Y_j + 0.05 X10 + 0.07 X11 - 0.56X12 + 0.07 X13 \]

With \( R^2 = 85.9\% \). This means taking into account the spatial effects of an increase in the R2 value of 85.0% to 85.9%. It means that taking into account the spatial effects obtained that environmental factors can explain the diversity of the variable incidence of dengue fever was 85.9%, while the rest is explained by variables beyond that. This model there are three variables that were not significant ventilation, Possession of a disposal site density occupant. The subsequent modeling was insignificant variables excluded from the model in order to get the new model as follows:

\[ Y_i = 54.25 + 0.30 \sum_{j=1}^{n} w_{ij} Y_j - 0.56X12 \]

Interpretation of the model are:

Intercepts of 54.25 meaning that if the environment variable all were = 0, it is predicted that occur the number of dengue fever cases by 54 people. Spatial lag coefficient = - 0.16 means that if an incident occurs the dengue fever up one unit, it can reduce the incidence of dengue fever in the region around of at 16 persons per 100 people. This figure also show the presence of dengue fever occurrence dependencies from one region to the other regions. If other factors held constant, if the number of larvae free up one unit it can reduce the incidence of dengue fever by 56 people per 100 people. With this model we can predict the magnitude of dengue incidence in terms of environmental aspects in every village in the Tanete Riattang district and West Tanate Riattang.

d. Structural equation model based on the spatial incidence of dengue fever base on environmental and behavior aspects

Results of structural equation modeling analysis of the spatial incidence of dengue fever and behavior based on environmental aspects of using weighted matrices Queen Contiguity in District of Tanete Riattang and West Tanate Riattang with GeOda program showed that only behavioral factor was significant. \( R^2 \) value after merging all behavior and environmental indicators obtained a model as follows:

\[ \eta_i = 0.02 + 0.19 \sum_{j=1}^{n} w_{ij} \eta_j - 0.46 \text{ Environment} - 0.52 \text{ Behaviour} \]

With \( R^2 = 72.9\% \). It means that taking into account the spatial effects obtained that behavioral and environmental factors can explain the diversity of the variable incidence of dengue fever by 72.9%, while the rest is explained by variables beyond that.
Interpretation of the model are:

Intercept of 0.02 means that if the environmental and behavioral variables = 0, it is predicted that incidence of dengue cases for 2 people per 100 people. Spatial lag coefficient = 0.19 means that if an incident occurs dengue area up one unit, it can reduce the incidence of dengue fever in the region around by 19 people per 100 people. This figure also show the presence of dengue fever occurrence dependencies from one region to the other regions. If other factors held constant or if the numbers go up one unit of environmental factors can reduce the incidence of dengue fever was 46 people per 100 people. If other factors held constant, if the number of behavioral factors up one unit it can reduce the incidence of dengue fever was 52 people per 100 people.

In this model, it can be analyzed that more behavioral factors contribute to the occurrence of dengue cases than environmental factors. It can be explained due to environmental factors as an indicator play an important role to dengue fever occurrence. Thus the presence of larvae in the water reservoirs. From the interview respondents and health staffs who handle dengue cases explained that the presence of larvae in the water reservoirs because people are lazy to clean and drain the water reservoir with water wastage reasons can lead to the increase of water payments.

Conclusions

Based on the results of the research, data analysis and discussion in the previous chapter, the researcher took the following conclusion:
1. The pattern of spread of dengue cases in the Tanete Raiattang district West Tanete Raiattang are clustered (Clustered).
2. Model of dengue fever incidence based on aspects of behavior using the area approach and weighting matrix queen contiguity in the Tanete Raiattang and West Tanete Raiattang districts are:

\[ Y_i = 41.03 + 0.38 \sum_{j=1}^{n} W_{ij} y_j - 0.55X1 + 0.27 X3 - 0.43 X4 - 0.62 X5 + 0.39 X6 - 0.19 X7 - 0.15 X8 + 0.33 X9. \]

With \( R^2 = 90.3 \), it means that taking into account spatial effects obtained that behavioral factors can explain the variable incidence of dengue fever diversity of 90.3%, while the rest is explained by variables not examined outside.
3. Model dengue fever incidence based on the environmental aspects by using the area approach of weighting matrix and queen contiguity in the Tanete Raiattang and West Tanete Raiattang districts are:

\[ Y_i = 54.25 + 0.30 \sum_{j=1}^{n} W_{ij} y_j - 0.56X12 \]

With \( R^2 = 85.9\% \). This means that taking into account the spatial effects it was obtained that environmental factors can explain the diversity of the variable incidence of dengue fever was 85.9%, while the rest is explained by other variables not studied beyond.
4. Spatial structural equation model of dengue fever occurrence and behavior based on environmental aspects of using area approach and weighting matrix of queen contiguity the Tanete Raiattang and West Tanete Raiattang districts are:

\[ \eta_i = 0.02 + 0.19 \sum_{j=1}^{n} W_{ij} \eta_j - 0.46 \text{ environment} - 0.52 \text{ behavior} \]

With \( R^2 = 72.9 \). This means that taking into account the spatial effects it was obtained that behavioral and environmental factors can explain the diversity of the variable incidence of dengue fever by 72.9%, while the rest is explained by variables not examined outside.

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References